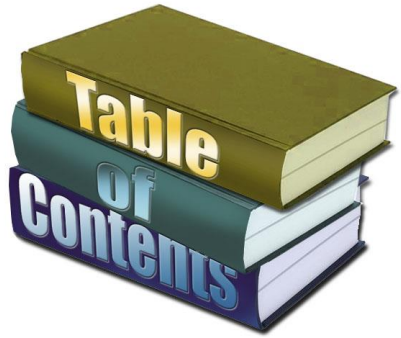


Prof. Md. Mahabubul Islam Majumder
Professor & Head,
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Central Medical College, Cumilla,
Bangladesh



1. Introduction
2. Evolution
3. Perspectives
4. Approaches
5. Strategies
6. Goal
7. New methods
8. Conclusions



Evolution of Internal Medicine

- ❑ Internal medicine has a rich history dating back to ancient civilizations.
- ❑ Begin by the roots of internal medicine in ancient Greece, with physicians like Hippocrates laying the groundwork for understanding the internal workings of the human body.
- ❑ Examples include William Harvey's discovery of blood circulation in the 17th century, the development of the stethoscope by René Laennec in the 19th century, and the introduction of antibiotics like penicillin by Alexander Fleming in the 20th century and many more.

Importance of lifelong learning in internal medicine

- ✓ The development and maintenance of professional competence through lifelong learning is indispensable to all physicians
- ✓ The field of medicine is a dynamic and ever-evolving discipline, where knowledge, techniques, and technologies are constantly advancing.
- ✓ In this fast-paced environment, the importance of continuous learning in medicine cannot be overstated



**Why continuous learning
is essential in **Internal
medicine** and how it
benefits both healthcare
providers and the patients
they serve?**



Because-

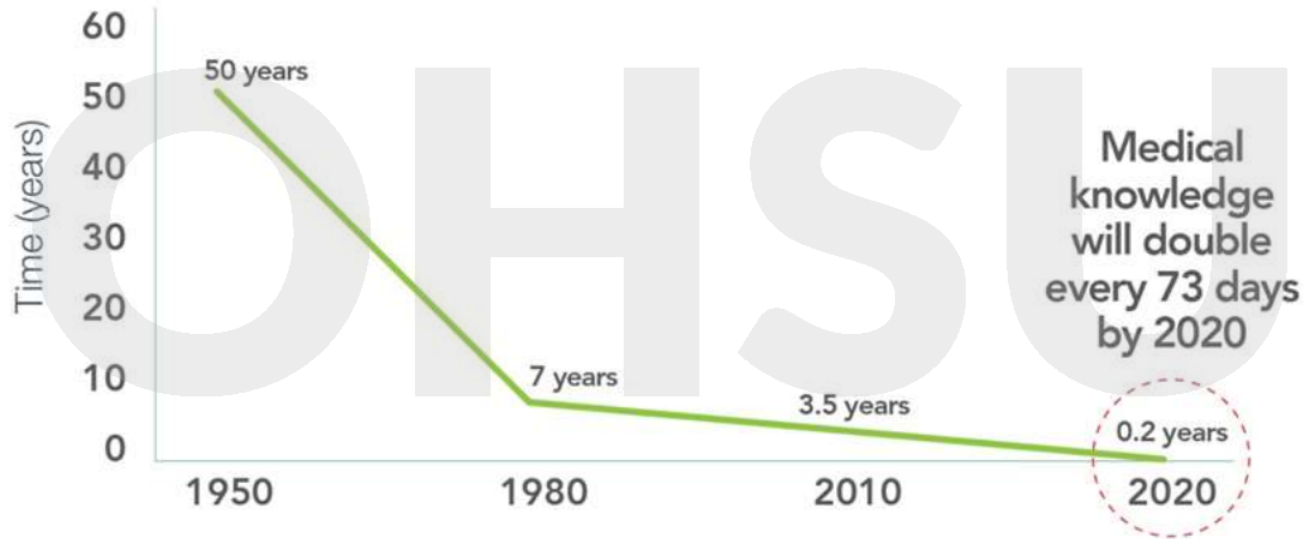
- ❑ **Keeping Up with Medical Advancements**
- ❑ **Adapting to Changing Guidelines**
- ❑ **Enhancing Diagnostic Skills**
- ❑ **Improving Patient Outcomes**
- ❑ **Fostering Critical Thinking and Problem-Solving**
- ❑ **Navigating Ethical and Legal Changes**
- ❑ **Career Advancement and Specialization**
- ❑ **Patient Trust and Confidence**



How has lifelong learning evolved?

- ❑ Learning is never finished in the field of Internal medicine.
- ❑ Lifelong learning updates obsolete knowledge. Medical knowledge grows at an exponential rate. **The doubling time** for medical knowledge was estimated at 50 years in 1950, it accelerated to 7 years in 1980, 3.5 years in 2010, and is 73 days in 2020.
- ❑ The past 100 years of medicine have seen an evolution of the practice, in both medical expertise and non-technical expectations of the doctor's role

Time To Double Medical Knowledge Is Decreasing



Graphic source, NCBI, "CHALLENGES AND OPPORTUNITIES FACING MEDICAL EDUCATION"
Peter Densen, MD, 2011

How has lifelong learning evolved?

- ❑ At present there are **millions of biomedical scientific papers** published each year.
- ❑ As knowledge grows exponentially, ideas become obsolete exponentially.
- ❑ Lifelong learning is essential to continually update obsolete knowledge and keep up-to-date.
- ❑ These discoveries paved the way for a deeper understanding of diseases and personalized medicine.

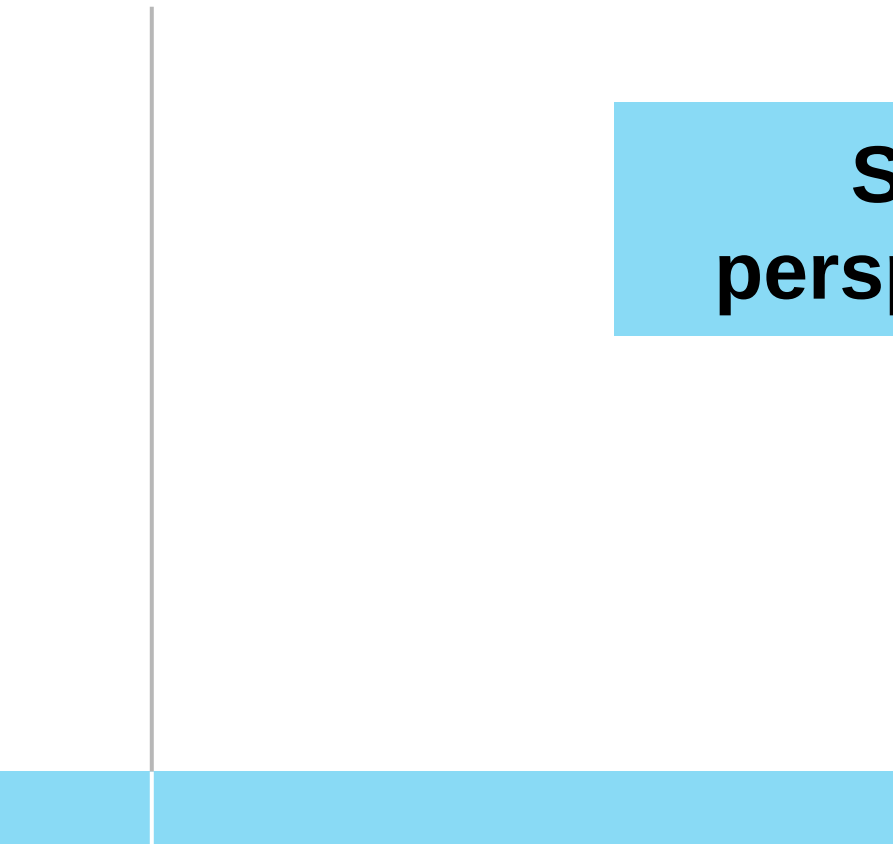


Lifelong learning leads to intellectual humility

Doctors that continue learning after medical education witness some of their most cherished ideas become obsolete.

It is the nature of scientific discovery. First, ideas are generated, tested by replication and more rigorous experiments.

The lifelong learner learns that knowledge is dynamic and fleeting. Current knowledge represents only a slice in time in the evolution of knowledge.



**Some
perspectives**

COVID-19 Now?

- Over the past few years, an enormous amount of research has been conducted and published on COVID-19 and coronaviruses.
- We now know much more about transmission, optimal treatments, preventive strategies, and long-term effects.
- Treatment guidelines have evolved as more evidence emerges.
- The COVID-19 pandemic has led to accelerated learning and knowledge sharing among doctors and healthcare workers around the world.



contd.

- ✓ **Treatment guidelines** have been developed and changing.
- ✓ **New antiviral drugs and second-generation vaccines** are in development,
- ✓ **Long-term and post-dengue complications** are being recognized, including potential neurological, metabolic, and circulatory sequelae.



Sharif, N., Sharif, N., Khan, A., Dey, S. K. (2024). Epidemiologic and Clinical Characteristics of the 2023 Dengue Outbreak in Bangladesh. *Open Forum Infectious Diseases*, 11(2), ofae066.

<https://doi.org/10.1093/ofid/ofae066>



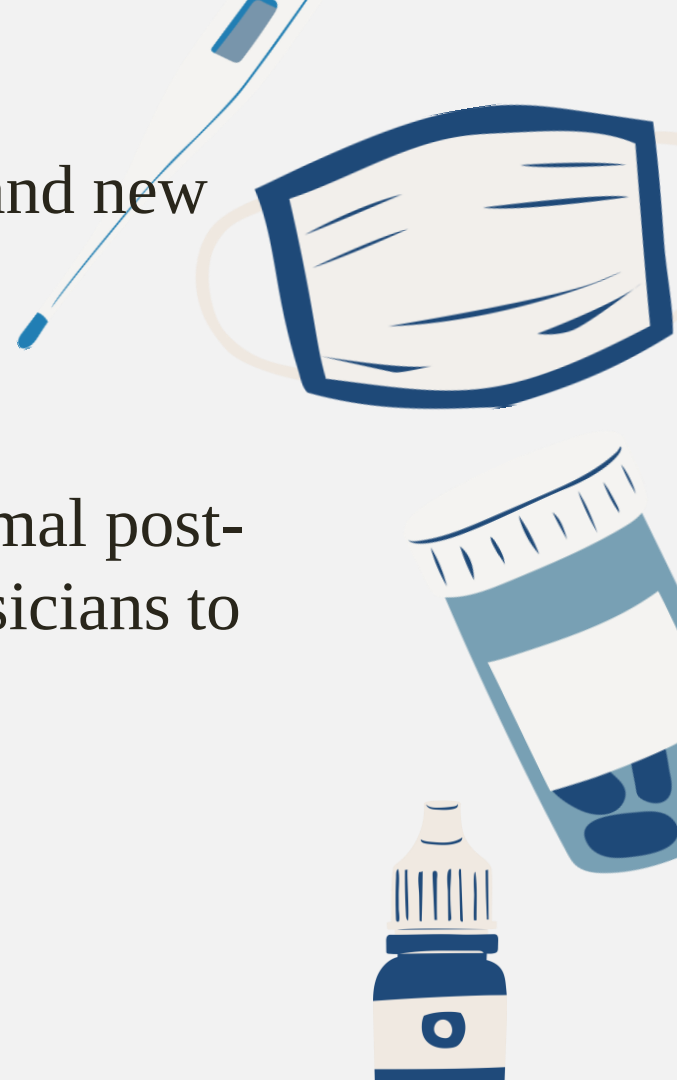
Traditional approaches for doctors' continuous learning in internal medicine

- ❑ **Conferences and symposia.**
- ❑ **Medical journals** -to stay up-to-date on new studies.
- ❑ **Textbooks**
- ❑ **In-hospital grand rounds** - Many hospitals conducted regularly.
- ❑ **CME courses** - Doctors had to complete a set number of accredited continuing medical education hours annually through short courses.

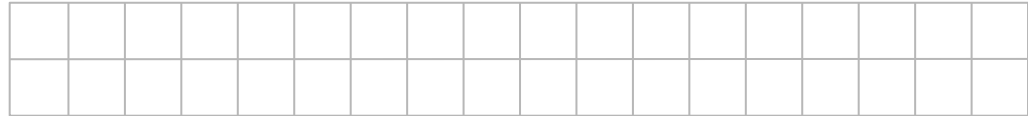


Contd.

- ❑ **Peer discussions** - Discussing cases and new research with colleagues
- ❑ **Drug/equipment sales visits**
- ❑ **Observation of senior physicians.**
- ❑ **Residency/fellowship training** - Formal post-graduate training exposed young physicians to latest knowledge and techniques.
- ❑ **Self-study.**



While these traditional systems persist, the internet and digital learning tools have vastly expanded options for continuous medical learning today.





lifelong learning leads to good medical decisions.

The lifelong learner can present their patient with good information.

They have a comprehensive knowledge base, an updated knowledge base, and can discard outdated ideas.

Good information leads to good medical decisions

Lifelong learning begins with a solid foundation in education

A solid foundation in education is very important. Medical education is not only about memorizing facts, it is about being inspired, and learning how to think. As the Roman philosopher **Plutarch** wrote,

"The mind is not a vessel to be filled but a fire to be kindled."

Components of adaptability in medical learning:

1 Assess your adaptability level

Understood current strength and weakness

Adaptability
Quitient test

2 Seek learning opportunities

Enroll in online courses, workshops, or seminars

Keep up-to-date latest
developments

3 Embrace uncertainty and change

Mindfulness reduce stress, anxiety, and
negative emotions increases adaptability

Who encourages and
modulate concepts

4 Build your support network

With your colleagues, peers, mentors, or
coaches.

5 Reflect and celebrate

Writing keeping a journal, writing a blog or
presentation

6 Here's what else to consider

Following these tips, you can improve your
adaptability.

How can we continue Lifelong Learning in Internal Medicine????

Self-regulated learning (SRL) describes the process of:

- ✓ **goal setting**
- ✓ **Planning**
- ✓ **Monitoring**
- ✓ **Metacognition**
- ✓ **Attention**
- ✓ **learning strategies**
- ✓ **persistence**
- ✓ **time management**
- ✓ **Motivation**
- ✓ **emotional**
- ✓ **control and effort**



Strategies for Lifelong Learning

Embrace Technological Advances

- ❑ **Online CME courses** - Various accredited online learning platforms like UpToDate, Medscape, ACCME offer on-demand video courses.
- ❑ **Online Courses and Webinars:**
- ❑ **Medical Apps:** UpToDate etc



Ching, K., et al. (2019). "The impact of digital health coaching in diabetes education: a systematic review." BMC Medical Education, 19, 341.
<https://doi.org/10.1186/s12909-019-1891-5>

Beneficial Features:

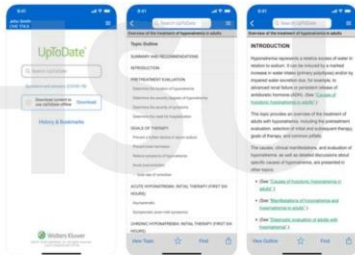
- Comprehensive & provides citations to primary literature
- Has infiltrated the market at is ubiquitously recognized (is used on "open book" formats for some medical boards)
- Lexicomp drug reference

Caveats:

- Recommendations are often "expert opinion"

Educational Credit: CME & ABIM MOC available

Cost: \$519+ / yr (individual physician subscription)



DynaMed Plus

Beneficial Features:

- Good for brief, succinct pearls about conditions
- "Goldilocks" amount of info - not too much, not too little
- Often written in collaboration with guideline committees/orgs

Caveats:

- Bullet point style leaves off some nuanced discussion

Educational Credit: CME & ABIM MOC available

Cost: \$395/yr for individual physicians, free with ACP membership



BMJ Best Practice

Beneficial Features:

- Good for brief, succinct pearls about conditions, treatment
- Succinct in content
- Great User interface & very clinically focused

Caveats:

- Does not readily provide primary literature citations
- Not as much content compared to Dynamed/Up to Date

Educational Credit: Up to 20 hrs AAFP CME available (In theory AMA CME as well)

Cost: ~ \$300 /yr for individual physicians subscribers



Beneficial Features:

- The gold standard for dermatology applications
- Most pictures of reference applications
- DDx Engine

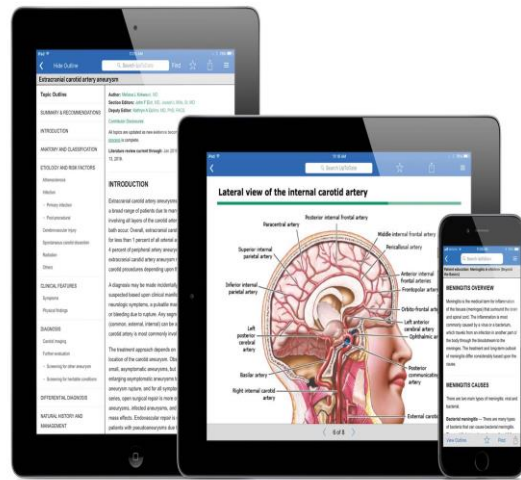
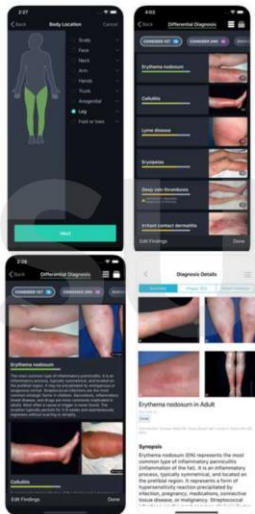
Caveats:

- Less robust evidence based compared to others: all inclusive" reference

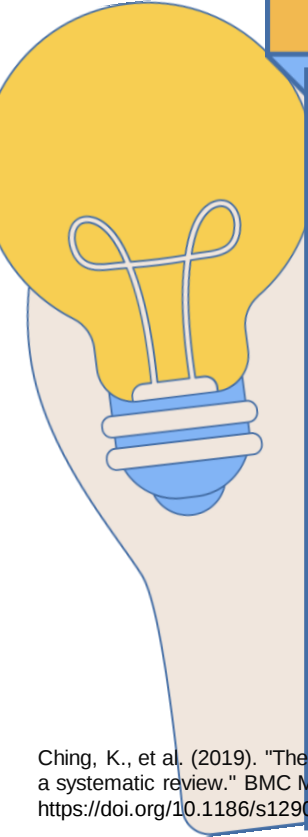
Educational Credits:

CME for individual subscribers

Cost: \$399+ / yr for individual physician subscribers



Establish Personal Learning Goals

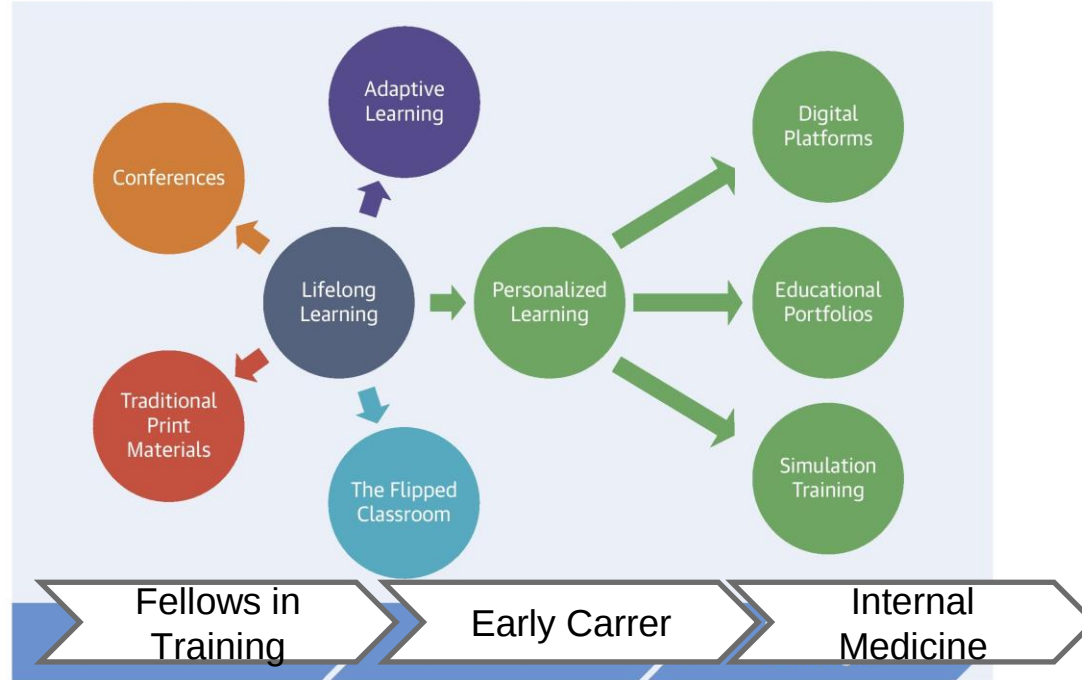


1. Set **SMART** goals - Specific, Measurable, Achievable, Relevant, Time-bound.
2. Align goals to knowledge gaps and interests.
3. Examples: new skills, CME hours, updating medical knowledge.
4. Track progress, modify goals as needs evolve.
5. Intrinsic motivation - goals drive continuous improvement

- **Tracking Progress**
- **Self-Assessment**

Novel Educational Tools for Lifelong Learning in Internal Medicine

CENTRAL ILLUSTRATION: Lifelong Learning Tools for Cardiovascular Medicine



Narang, A. et al. J Am Coll Cardiol. 2018;71(4):454-62.

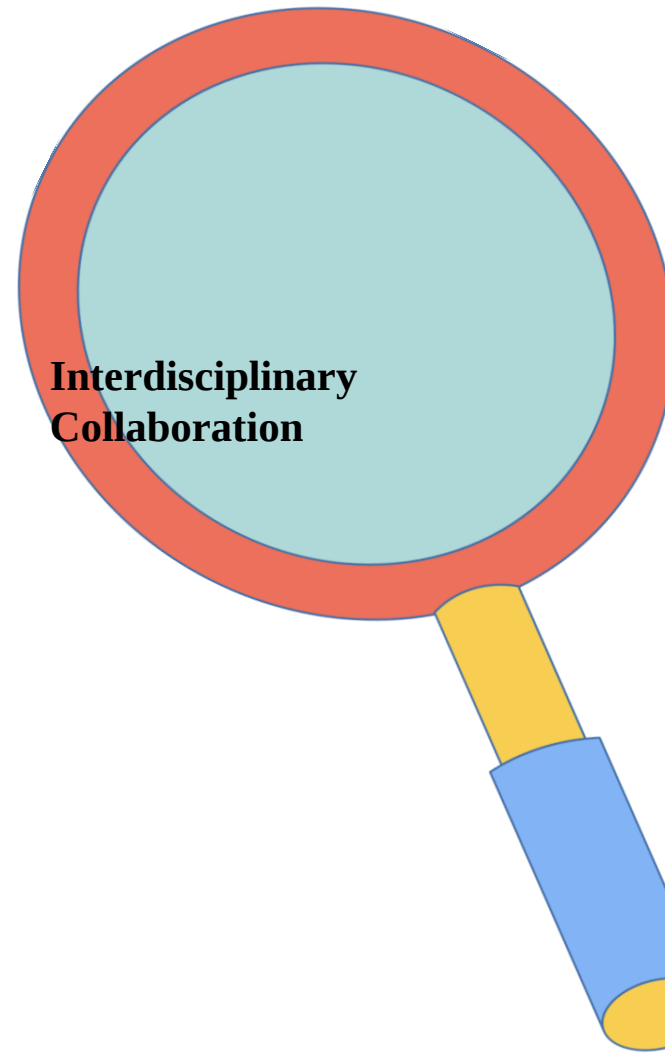
Engage in Interdisciplinary Collaboration

- ✓ Collaboration leads to holistic, patient-centered care.
- ✓ Complex cases often require interdisciplinary expertise- team approach.
- ✓ Example: Combining internist's broad medical knowledge with focused expertise.



Contd.

- ✓ Specialists collaborating interdependently provides comprehensive care. Patients benefit from joint discussion of options.
- ✓ **Breaking down silos** leads to innovative solutions.
Brainstorming as a team spurs new ideas.
- ✓ Shared learning and mentorship.



Participate in Research and Clinical Trials

- ✓ Stay actively involved in research.
- ✓ Participation in **clinical trials** allows early experience with new therapies
- ✓ Opportunity to contribute to advancement of medical knowledge
- ✓ Develop research skills - **protocol design, data analysis, writing**
- ✓ Build network with **research community**, collaborators
- ✓ Balance research with other responsibilities



Staying Updated Through Research Engagement

- ✓ Reading **latest studies and trials** provides exposure to emerging evidence
- ✓ **Presenting and publishing** findings disseminates new knowledge
- ✓ **Attending conferences** to share and discuss
- ✓ **Joining research groups**
- ✓ **Using online research tools and alerts for current awareness**
- ✓ **Recruiting patients for trials** raises community awareness of advances

Novak, M. (2015). Lifelong Learning: Strategies to Keep Your Edge.
Retrieved from

https://facultyaffairs.med.ufl.edu/files/2015/01/Lifelong_learning_2015.pdf

Foster a Culture of Continuous Improvement

- ❑ Implement **peer feedback** systems for constructive insights
- ❑ Create **mentoring programs** - experienced doctors guide younger colleagues
- ❑ Encourage regular **self-assessment** and reflection
- ❑ Discuss **interesting cases** and debrief as a team
- ❑ Stay updated on **latest guidelines and evidence**



Case Studies in Lifelong Learning



- ❑ The most natural way for doctors to continue learning is through the cases they see.
- ❑ Learning concepts and principles from real-world cases relevant to a doctor.
- ❑ This is in contrast to conventional medical learning, where facts and concepts are presented directly without context.

Case Studies in Lifelong Learning

- ❑ **Real-World Examples:** Showcase stories of doctors who have successfully implemented lifelong learning strategies.
- ❑ **Diverse Experiences:** Highlight examples across various medical fields.
- ❑ **Impact on Patient Care:** Illustrate how lifelong learning has directly influenced patient care, improved outcomes, and enhanced overall healthcare delivery.

Received: 21 June 2023 | Revised: 9 August 2023 | Accepted: 12 August 2023
DOI: 10.1002/ccr3.7845

Clinical Case Reports WILEY

Accidental poisoning with aconite overdose: A case report and resuscitative emergency management in a tertiary level hospital of Bangladesh

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Hossain Mohammad Shihab²

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²Central Medical College, Cumilla, Bangladesh
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Email: ashrafmahadi123mahadi@gmail.com

1 | BACKGROUND

Herbal or traditional medicines have become important

Key Clinical Message
Intoxication with aconite, a common over-the-counter herb, can result in ventricular tachycardia and requires immediate monitoring in a critical care setting. Educational efforts in the appropriate use of aconite can prevent vent intoxication.

KEYWORDS
accidental poisoning, aconite

CASE REPORT

WILEY

Black-brown hairy tongue: An unusual adverse effect of linezolid

Ashrafur Rahman Mahadi¹ | Mahabubul Islam Majumder²

Majumder et al.
Antimicrobial Resistance & Infection Control
<https://doi.org/10.1186/s13756-022-01197-6> (2022) 11:156

RESEARCH

Antibiotic resistance pattern of microorganisms causing urinary tract infection: a 10-year comparative analysis in a tertiary care hospital of Bangladesh

Md. Mahabubul Islam Majumder¹, Ashrafur Rahman Mahadi^{2*}, Tareq Ahmed³, Mostaque Ahmed¹, Mohammad Nazim Uddin¹ and Md. Zahurul Alam⁴

Abstract

Background: Antimicrobial resistance is an emerging concern globally in recent years. Management of common infectious diseases like urinary tract infection (UTI) has become challenging. In this context, the purpose of this study is to compare the shifting trends in bacteriology and antibiotic resistance pattern among uropathogens to similar studies conducted at various times in Bangladesh.

Methods: It was a cross-sectional study conducted at the CUMILLA MEDICAL COLLEGE HOSPITAL'S MEDICINE DEPARTMENT in three phases (2011, 2016, 2021). Patients who visited the outpatient and inpatient departments of the study center with symptoms suggestive of a urinary tract infection were undergone urine culture. Those who yielded positive growth in urine culture were finally included in the study.

Results: *Escherichia coli* (62% in 2021, 86% in 2016 and 76% in 2011) and *Klebsiella* species (11% in 2021, almost > 50% in 2011) were the most frequently isolated bacteria. Overall, in Gram-negative organisms, resistance to azole, ciprofloxacin, cefturoxime, cephradine, amoxicillin and nalidixic acid, moderately by 66.67%, 64.52% and gentamicin (53.13%) and low resistance to nitrofurantoin (25.38%) were observed. Resistance in common antibiotics has been consistently low.

Abstract

Linezolid-induced black hairy tongue (BHT) is an uncommon side effect. We present a case of linezolid induced BHT and evaluate relevant literature from the home and worldwide. Its goal is to offer a secure and appropriate foundation for clinical drug use. A 23-year-old male with recurrent boil infection erroneously reported by gram-negative methicillin-resistant *Staphylococcus aureus* (MRSA) by pus culture, which was sent to a small clinic (diagnostic center) in a rural region of Bangladesh where he was treated for that reoccurring boil infection. The patient was sent to a tertiary care hospital for pus-forming bacteria (*Klebsiella*), a gram-negative bacterium. The patient's C/S report. Linezolid was administered to the patient for 10 days. On the 10th day, the patient was discharged from that rural clinic. On the 12th day, the patient presented to the hospital with BHT but was not treated. The patient was tolerable, and he finished the course of medicine, all tongue hairs were removed. It was determined that this patient had BHT. The use of linezolid is associated with BHT. However, little information about the pathogenesis of BHT is present here a case of linezolid induced BHT. Covered are the etiology, pathogenesis, and management of BHT.

Open Access



There are several advantages of case-based learning over conventional methods, they include:

- Improves understanding of knowledge
- Improves retention of knowledge
- Stimulates interest
- Promotes responsibility and accountability
- Teaches problem solving skills and critical thinking
- Promotes self-learning behavior
- Enhances resourcefulness - where and how to access information

Future Trends in Medical Education



Artificial Intelligence in Medicine learning

- ❑ **AI is revolutionizing in medical education-** educational content delivery.
- ❑ It also **creates potential ethical considerations** and challenges associated with AI integration.

Here are some ways AI can be utilized for continuous learning in internal medicine:

- **Intelligent tutoring systems** - AI tutors provide Interactive clinical case simulations for diagnosis and treatment education.
- **Clinical decision support** - AI can analyze patient data and provide diagnostic and treatment suggestions
- **Information retrieval** - AI can rapidly search latest medical literature and guidelines
- **Personalized updates** - AI can deliver



Disadvantages or risks of use AI for continuous learning in medicine:

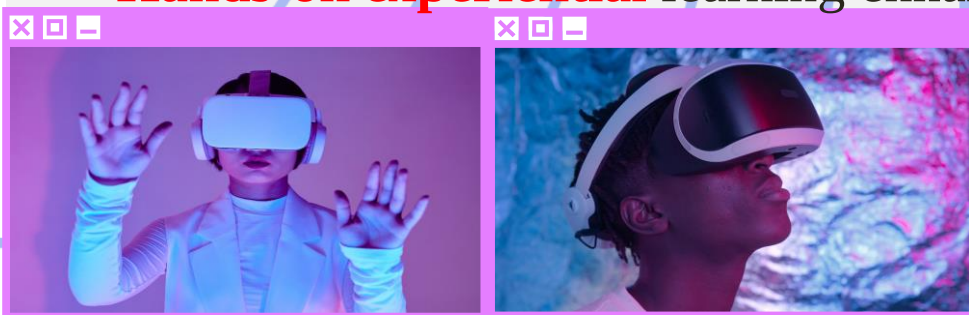
- **Over-reliance on AI** -
- **Deskilling** -
- **Biased data** -
- **Dehumanizing effects** - Overuse of AI could negatively impact doctor-patient relationships.
- **Technophobia** - Physician reluctance or inability to use complex AI tools

To mitigate risks, we must ensure human oversight of AI-supported learning, validate tools extensively, and focus AI on enhancing (not replacing) human knowledge.

Virtual Reality Simulations



- Example: **Interventional medicine trainees using VR** to practice complex procedures before real interventions
- Repeated practice in **realistic VR environments** improved intervention skills
- Resulted in fewer errors, faster completion times versus no VR training
- VR allows **developing competency** in high-risk procedures without endangering patients
- Hands-on experiential** learning enhances skill acquisition and retention



Han, ER., Yeo, S., Kim, MJ. *et al.* Medical education trends for future physicians in the era of advanced technology and artificial intelligence: an integrative review. *BMC Med Educ* **19**, 460 (2019). <https://doi.org/10.1186/s12909-019-1891-5>

Gamification in Medical Learning

- Increased participation in medical quizzes and discussions
- Provided motivation to regularly use platform and engage with content
- Leaderboards tapped into competitive drive, rewarded top performers
- Resulted in improved exam scores, long-term retention of knowledge
- Gamification incentivizes and energizes learning through fun competition



Han, ER., Yeo, S., Kim, MJ. *et al.* Medical education trends for future physicians in the era of advanced technology and artificial intelligence: an integrative review. *BMC Med Educ* **19**, 460 (2019).
<https://doi.org/10.1186/s12909-019-1891-5>



Here are some ways social media can be leveraged for continuous learning in internal medicine:

- ❑ **Joining professional medical groups** on Facebook, LinkedIn, Twitter to discuss cases, share insights, and disseminate new research.
- ❑ **Following thought leaders, institutes, journals** to get notified of the latest publications and guidelines.
- ❑ Connecting with colleagues and peers globally for real-time consultation on challenging cases.
- ❑ **Sharing and discussing** interesting clinical cases within closed social media groups to gain different perspectives.
- ❑ Live streaming grand rounds **or medical conferences** for broader participation.
- ❑ **Hosting webinars** or chats with experts to engage in question-and-answer learning.
- ❑ Posting brief **educational content** snippets for bite-sized, informal learning.

Obstacles to lifelong learning

- ❑ The greatest obstacle is lack of time.
- ❑ **Excessive workloads**, leaves little time
- ❑ Ultimately becomes obsolete soon after.
- ❑ This is compounded by the problem of physician burnout.
- ❑ **Over 50% of doctors** are so disenchanted with the practice of medicine they simply lack interest in learning.



Other obstacles to lifelong learning include:

- **Poor initial training** - Attending schools interested only in making sure its students pass board exams.
- **Over-confidence** - A common cognitive error in doctors, lack awareness of their ignorance.
- **Conflict of interest** - A doctors ability to learn may be clouded if it conflicts with his ability to earn. As American author Upton Sinclair famously said,
"It is difficult to get a man to understand something when his salary depends upon his not understanding it."



Summary of the major changes and new systems for continuous learning in internal medicine today:

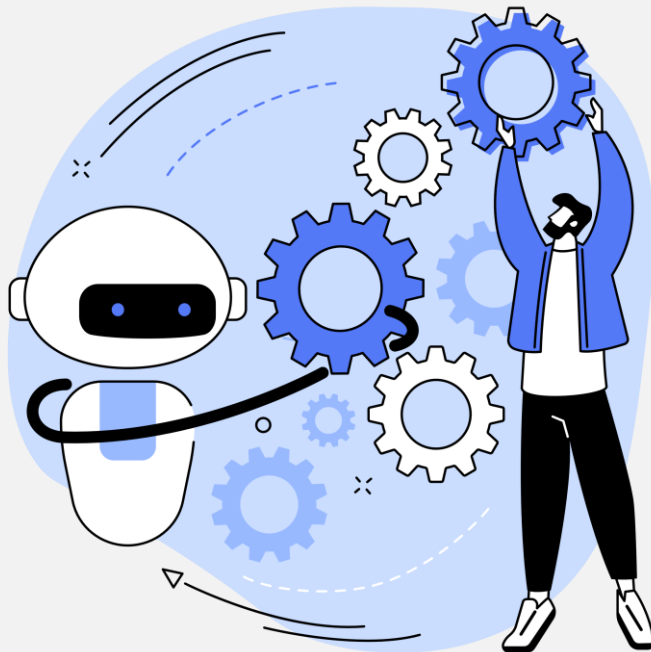
Online CME courses

Digital textbooks

Virtual conferences

Social media groups

Clinical decision support tools



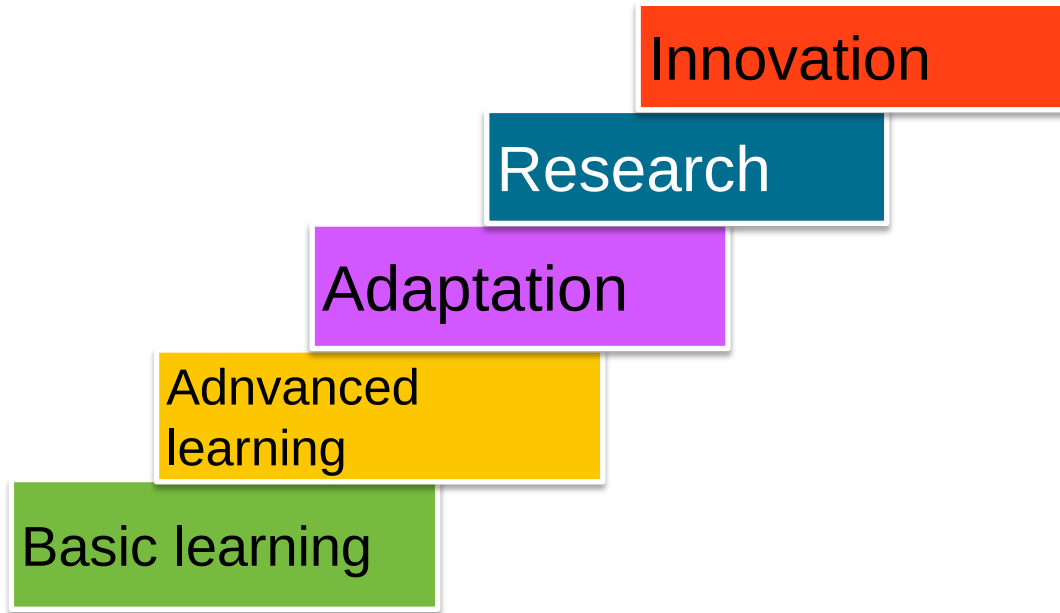
Podcasts and videos

Online collaboration

Artificial intelligence

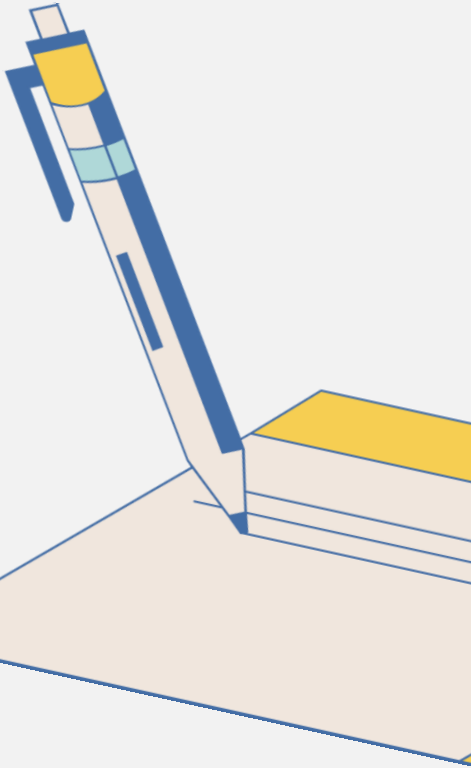
Mobile apps

Quality improvement data



Take Home Messages

- ❑ **For lifelong learning environment, continuously adopting appropriate learning methods and adapting to new techniques.**
- ❑ **In a technology-driven era, leveraging models can help balance educational and clinical responsibilities and practice more seamlessly than ever before.**
- ❑ **In this manner, the unrealized potential of lifelong learning may be achieved.**



**THANK
YOU!**

